

5    Claims

1.    A tubular connection for connecting an upper tubular member having an upper axis with a lower tubular member having a lower axis, the tubular connection comprising:
  - 10    a latch body radially movable between an unlatch position and a latched position;
  - an engaging surface on the upper tubular member for substantially planar engagement with a stop surface on the lower tubular member;
  - at least one inner load flank on each tubular member, a load flank on at least one tubular member angled with respect to the axis of the at least one tubular member;
  - 15    at least one outer load flank on the latch body for engaging the at least one inner load flank on each tubular member to urge the engaging surface axially toward the stop surface;
  - a radially projecting member on one of the latch body and one of the tubular members, the partially projecting member extending radially inward substantially beyond the at least one inner load flank on the latch body axially adjacent the projecting member, or extending radially outward substantially beyond the at least one outer load flank on the tubular member axially adjacent the projecting member; and
  - 25    a guide recess in the other of the latch body and the one of the tubular members for receiving the radially projecting member to guide the latch body along a desired trajectory when the latch body is moved radially from the unlatch position to the latched position.
- 30    2.    A tubular connection as defined in Claim 1, wherein at least one of a radial length of the radially projecting member and a radial depth of the guide recess limits movement of the latch body with respect to the tubular members.

5        3.    A tubular connection as defined in Claim 1, wherein the radially projecting member is at least partially positioned within the guide recess when the latch body is in the unlatched position and the inner load flanks are radially spaced from the outer load flanks.

10       4.    A tubular connection as defined in Claim 1, further comprising:  
on actuator axially movable with respect to the latch body; and  
a shoulder on the latch body moveable by the actuator, the shoulder angled to urge the latch body radially outward.

15       5.    A tubular connection as defined in Claim 4, wherein the actuator is fluid powered.

20       6.    A tubular connection as defined in Claim 1, further comprising:  
an axially moveable cam member for urging the latch radially inwardly, the cam member having a cam surface angled with respect to the latch body.

7.    A tubular connection as defined in Claim 6, wherein the cam member is axially moveable in respect to fluid pressure.

25       8.    A tubular connection as defined in Claim 1, further comprising:  
at least one elastomeric sealing member for sealing between the tubular members.

30       9.    A tubular connection as defined in Claim 1, further comprising:  
a bias member for radially biasing the latch body toward the unlatched position.

10.   A tubular connection as defined in Claim 9, wherein the latch body

5 comprises a c-ring.

11. A tubular connection as defined in Claim 1, wherein the latch body comprises a c-ring.

10 12. A tubular connection for connecting an upper tubular member having an upper axis with a lower tubular member having a lower axis, the tubular connection comprising:

a latch body radially movable between an unlatch position and a latch position;

15 at least one inner load flank on each tubular member, a load flank on at least one tubular member angled with respect to the axis of the at least one tubular member;

a fluid pressured cam member for urging the latch body radially inwardly, the cam member having a cam surface angled with respect to the latch body;

20 at least one inner load flank on each tubular member, a load flank on at least one tubular member angled with respect to the axis of the at least one tubular members;

25 at least one load flank on the latch body for engaging the at least one inner load flank on each tubular member to urge the engaging surface axially toward the stop surface;

at least one sealing member for sealing between the tubular members;

a radially projecting member on one of the latch body and one of the tubular members, the partially projecting member extending radially inward substantially beyond the at least one inner load flank on the latch body axially adjacent the projecting member, or extending radially outward substantially beyond the at least one outer load flank on the tubular member axially adjacent the projecting member;

30 a guide recess in the other of the latch body and the one of the tubular members for receiving the radially projecting member to guide the latch body along

- 5 a desired trajectory when the latch body is moved radially from the unlatch position to the latched position;
  - a fluid pressured actuator axially moveable with respect to the latch body;
- and
- 10 a shoulder on the latch body moveable by the actuator, the shoulder angled to urge the latch body radially outward.

13. A tubular connection as defined in Claim 12, further comprising:

a bias member for radially biasing the latch body toward the unlatched position.

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14. A tubular connection as defined in Claim 12, wherein the latch body comprises a c-ring.

15. A method of connecting an upper tubular member with a lower tubular member, the method comprising:

positioning a radially moveable latch body radially outward of each tubular member;

providing at least one inner load flank on each tubular member, a load flank on at least one tubular member angled with respect to an axis of the at least one tubular member;

providing at least one outer load flank on the latch body engageable with the at least one inner load flank on each tubular member;

providing a radially projecting member on one of the latch body and one of the tubular members, the partially projecting member extending radially inward

30 substantially beyond the at least one inner load flank on the latch body axially adjacent the projecting member, or extending radially outward substantially beyond the at least one outer load flank on the tubular member axially adjacent the projecting member;

5 providing a guide recess in the other of the latch body and the one of the tubular members for receiving the radially projecting member to guide the latch body along a desired trajectory when the latch body is moved radially from the unlatch position to the latched position; and

10 urging the latch body radially inwardly to engage the at least one inner load flank with the plurality of outer load flanks, and to urge the tubular members axially toward each other.

16. A method as defined in Claim 15, wherein urging the latch body radially inward comprises:

15 providing a cam member having a cam surface angled with respect to the latch body; and

moving the cam member axially with respect to the latch body to urge the latch body radially to the latch position.

20 17. A method as defined in Claim 15, further comprising:

providing a actuator axially movable with respect to the latch body and a shoulder fixed with respect to the latch body, the safety shoulder angled to urge the latch body to the unlatch position.